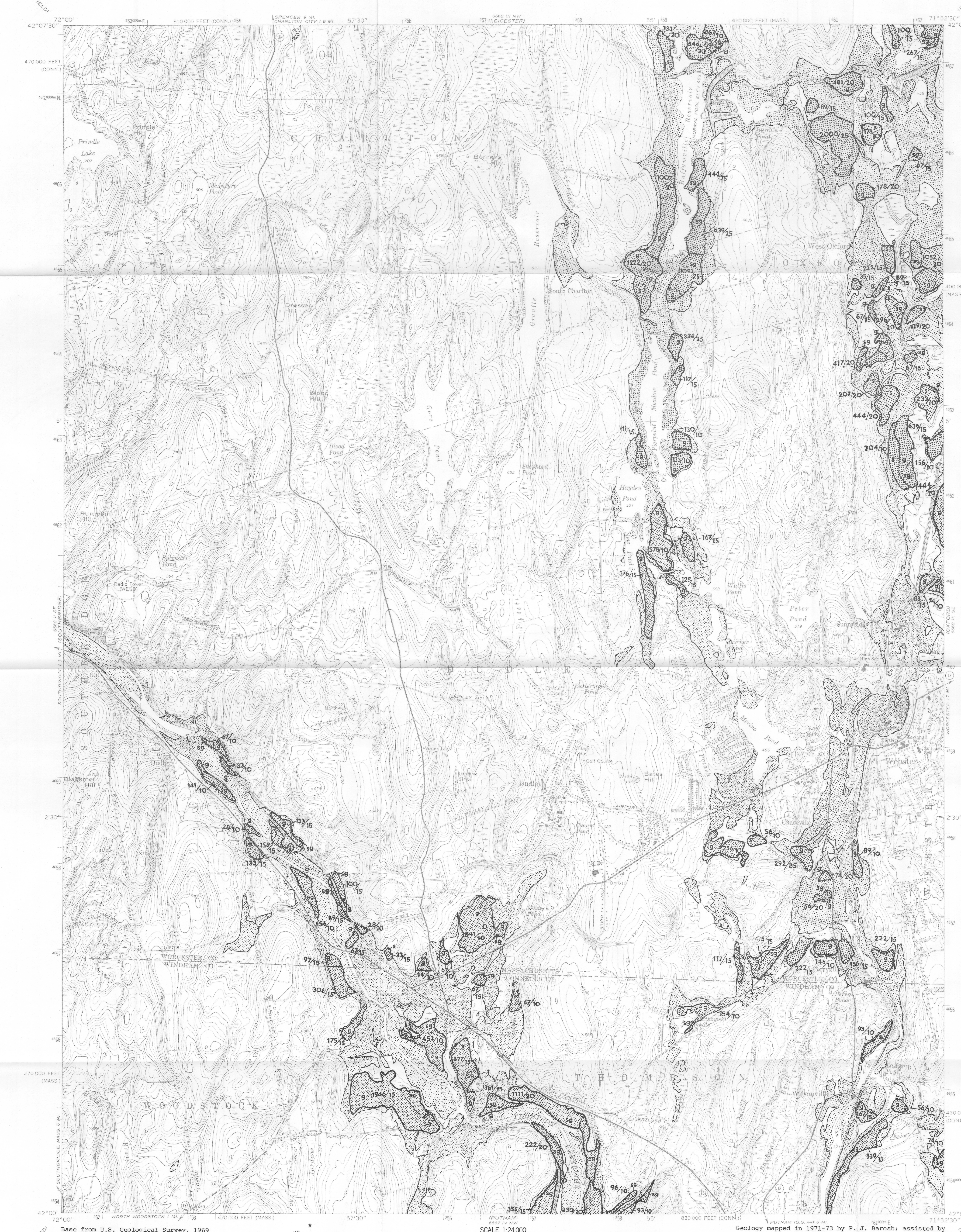
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

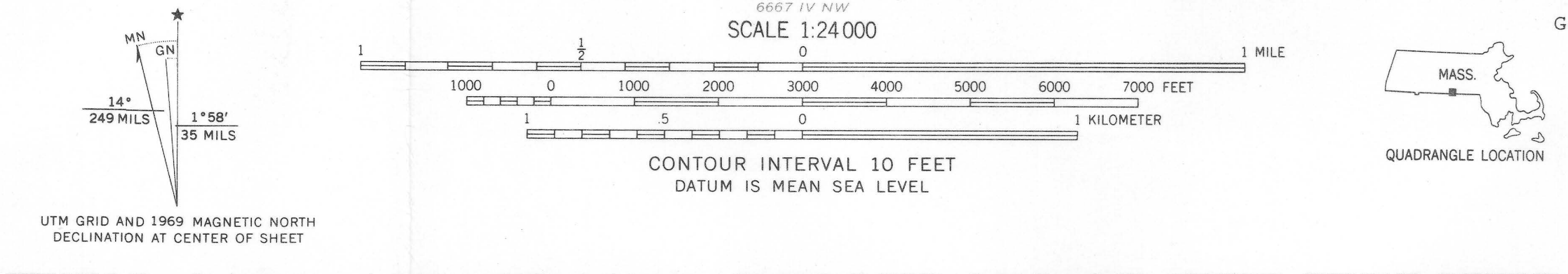
PREPARED IN COOPERATION WITH
THE COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS
AND
THE STATE OF CONNECTICUT GEOGICAL AND NATURAL HISTORY SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF-925
BAROSH-SAND AND GRAVEL RESOURCES,
WEBSTER QUAD., MASS. AND CONN.



Base from U.S. Geological Survey, 1969

10,000-foot grids based on Massachusetts coordinate system, mainland zone, and Connecticut coordinate system
1000-meter Universal Transverse Mercator grid ticks, zone 19



Geology mapped in 1971-73 by P. J. Barosh; assisted by William Sherwonit, 1971, and Mark Longman, 1972

EXPLANATION

───	Contact--Dashed where inferred
━━━	Contact between significant sand and gravel deposits and other deposits
▨	Mostly insignificant sand and gravel deposits--Locally include swamp deposits and fill
222/15 g s	Significant sand and gravel deposits--First number (222) indicates estimated volume of deposit in thousands of cubic yards (example, 222,000 yd^3); number following slash mark (15) indicates estimated average thickness of deposit in feet. Dominant material is indicated by letter symbol--s, sand; sg, sand and gravel; and g, gravel. m^3 equals 0.7645 y^3 and m equals 0.3048 ft

INTRODUCTION

Extensive areas in the Webster quadrangle are underlain by sand and gravel, which occur as glacial deposits and alluvium along the Quinebaug and French River valleys and along the valley extending northward from Merino Pond to the Buffumville Reservoir (Barosh, 1973). These deposits are the most important resource in the quadrangle and are being exploited in numerous sites within the quadrangle.

Sand and gravel resources of the area are used extensively by the construction industry and are often an important factor in construction costs. The rate at which the easily available deposits are being exploited or removed from commercial use by urbanization indicates sand and gravel should no longer be treated as inexhaustible resources, despite their widespread occurrence and relative abundance. The areas underlain by sand and gravel tend to form desirable locations for farming, housing, roads, and recreational uses in this region; consequently, mining must compete with these other uses. Furthermore, sand and gravel pits that are developed may not be fully depleted, because the mining depth is determined more by potential subsequent uses than by the depth of deposit. In addition, mining of glacial deposits and alluvium along river and lake shores may be considerably affected by special environmental considerations. Because of these factors, many of the deposits tabulated below will probably never be mined or only partly mined. If sand and gravel are to be mined in this area in the future, some type of land-use planning will be needed for proper resource management. For this, an understanding of the size and location of the deposits is of vital importance.

The area's significant sand and gravel deposits are shown on the map, and preliminary estimates of their reserves are enumerated in the table below. Additional deposits in the area appear to be too small for consideration for commercial development.

SAND AND GRAVEL RESERVES

The underlying till and bedrock surface is very irregular in places, and estimates of individual deposits can be in considerable error. However, errors for individual deposits probably balance out, and the totals should present the order of magnitude of reserves in the quadrangle.

Sand and gravel reserves are considered representative of the probable reserves above the water table, arbitrarily placed at the level of nearby rivers or ponds. These reserves were previously estimated on the basis of 1968 data for deposits in the Connecticut part of the Webster quadrangle (Vitali, 1970), but no figures were available for the Massachusetts portion. The author has revised the total for Connecticut by eliminating depleted deposits and urbanized areas and by accounting for adjustments in contacts. The resulting estimate of material available in significant deposits is approximately 6,100,000 cubic meters (8,000,000 cubic yards). The Massachusetts portion of the quadrangle has approximately 15,700,000 m^3 (20,500,000 yd^3) of sand and gravel in significant deposits above the water table. This gives an approximate total for the quadrangle of 21,800,000 m^3 (28,500,000 yd^3). The distribution of these reserves are tabulated in table 1.

Table 1.--Estimated sand and gravel deposits in the Webster quadrangle

Massachusetts:		
Pierpoint Meadow Pond-Buffumville Reservoir valley	6,000,000 m^3	7,800,000 yd^3
French River valley, north of Webster	6,300,000 m^3	8,300,000 yd^3
French River valley, south of Webster	1,700,000 m^3	2,200,000 yd^3
Quinebaug River valley	1,700,000 m^3	2,200,000 yd^3
	15,700,000 m^3	20,500,000 yd^3
Connecticut:		
French River drainage	700,000 m^3	900,000 yd^3
Quinebaug River drainage	5,400,000 m^3	7,100,000 yd^3
	6,100,000 m^3	8,000,000 yd^3
Total	21,800,000 m^3	28,500,000 yd^3

If resources are calculated to include the deposits that may be expected to extend to 3 meters (10 feet) below adjacent surface water level, an additional 150,000 m^3 (200,000 yd^3) in the Pierpoint Meadow Pond-Buffumville Reservoir area, 200,000 m^3 (300,000 yd^3) from the French River north of Webster, and smaller amounts elsewhere may be available. In addition, much of the alluvium, especially along the Quinebaug River, could be used for sand and gravel resources.

Sand, sand and gravel, and gravel deposits are shown by Barosh (1973) and are assumed to extend to a depth of 2 m (6 ft), except for terraces and places which may include small deposits of different sized materials. The areas with mixed sand and gravel may have thinly interlayered intermixed deposits or thick distinct sand and gravel layers. The terrace deposits usually have a thin cap (0-2 m, 0-6 ft) of gravel, and the size of the material in the underlying deposit is unknown except where exposed in pits. The unmarked alluvium is relatively thin and varies from gravel to sand. Very little silt or clay was seen in the quadrangle. The sorting of the material is variable depending on the type of glacial deposition; the material ranges from relatively poorly sorted ice-contact deposits to well-sorted delta materials.

REFERENCES CITED

Barosh, P. J., 1973, Preliminary surficial geologic map of the Webster quadrangle, Massachusetts and Connecticut: U.S. Geol. Survey open-file report.
Vitali, Rino, 1970, Construction aggregate availability study summary report: Highway district 11: Connecticut Dept. Transportation, Bur. Highways, Soils and Foundations Div., 49 p.

MAP SHOWING SAND AND GRAVEL RESOURCES OF THE WEBSTER QUADRANGLE, WORCESTER COUNTY, MASSACHUSETTS AND WINDHAM COUNTY, CONNECTICUT

By

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1978

Interior—Geological Survey, Reston, Virginia—1978

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